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**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SERVICE  
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT  
Silver Spring, Maryland 20910

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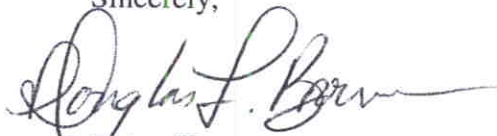
Dr. J. Frederick Grassle  
Director, Institute of Marine and Coastal Sciences  
Rutgers University  
71 Dudley Road  
New Brunswick, New Jersey 08901-8521

Dear Dr. Grassle:

Enclosed are the Final Evaluation Findings for the Jacques Cousteau National Estuarine Research Reserve, covering the period from November 1997 through September 2003.

We appreciate the cooperation and assistance of your staff during the evaluation.

Sincerely,

  
for Eldon Hout,  
Director

Enclosure

cc: Michael DeLuca, Rutgers IMCS  
Elaine Vaudreuil, NOAA/OCRM



**FINAL EVALUATION FINDINGS FOR THE  
JACQUES COUSTEAU-MULLICA RIVER  
NATIONAL ESTUARINE RESEARCH RESERVE IN NEW JERSEY**

**For the period covering  
November 1997 – September 2003**

Office of Ocean and Coastal Resource Management  
National Ocean Service  
National Oceanic and Atmospheric Administration  
U.S. Department of Commerce

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## EXECUTIVE SUMMARY

### A. OVERVIEW

Sections 312 and 315 of the Coastal Zone Management Act (CZMA) of 1972, as amended, require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic evaluations of federally designated National Estuarine Research Reserves (NERRs). This review examined the operation and management of the Jacques Cousteau-Mullica River National Estuarine Research Reserve (JCNERR) by the State of New Jersey during the period of November 1997 through September 2003.

The fundamental conclusion of this evaluation is that JCNERR is fully adhering to its programmatic obligations as defined by the approved final revised management plan, the terms of federal financial assistance awards and NERR System Regulations under Section 315 of the CZMA. NOAA may make two types of recommendations: (1) **Necessary Actions** address programmatic requirements and *must* be implemented by the indicated date; and (2) **Program Suggestions** describe actions that NOAA believes the state should take to improve the program but are not currently mandatory. Program Suggestions that are reiterated in consecutive evaluations due to continuing problems subsequently may be elevated to Necessary Actions. If no dates are indicated, the state is expected to address the recommendations by the time of the next Section 312 program review. This document contains seven recommendations in the form of program suggestions. No necessary actions were identified in this review.

### B. SUMMARY OF EVALUATION

As the first evaluation for the Reserve since its designation, the review team looked at the state's progress in carrying out the Reserve's management plan, particularly with regard to: staffing the reserve's core positions; developing and implementing research, monitoring, education and stewardship programs; developing facilities; and coordinating with partners, including the New Jersey coastal management program. A table summarizing the program's accomplishments and review team's recommendations can be found in Appendix C.

The team noted many accomplishments of the JCNERR, including: progress in staffing key positions; effectiveness in drawing on resources within the lead agency, Rutgers IMCS, to support development and implementation of the reserve's management plan, research, education, and coastal training programs; the success of the Reserve's efforts to introduce marine education into New Jersey schools and school districts; the extensive research program, and efforts of reserve staff to integrate research findings into education and training programs. The reserve has also established a successful

interpretive exhibit that helps raise awareness of coastal issues and the Reserve's visibility in the community.

The review team noted several areas for improvement. These include: the timeliness and quality of performance reports; the need to have a senior management presence at the Reserve visitor/education center in Tuckerton; the need to set realistic milestones and deadlines when updating the Reserve management plan, which is due for update this year; the need to better engage the Reserve Advisory Committee in reserve planning, particularly in the 5-year update of the Reserve's management plan; and to help facilitate improved coordination among the New Jersey coastal management program, Sea Grant program and the Reserve, particularly regarding delivery of training and technical assistance to local decision-makers on coastal issues.

During the site visit, the Reserve staff and/or review team noted several areas where NOAA might be able to help or improve its service to state partners. The Reserve asked for clearer guidance and more consistent application of standards for writing and reviewing performance reports and grant applications. The Reserve would like to improve its connection to other research programs within NOAA, particularly in NCCOS. Finally, the Reserve would welcome NOAA's support in strengthening relationships with the coastal program and Sea Grant program at the state level.

## I. INTRODUCTION

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System, a network of reserves that are protected for long-term research, environmental monitoring, education and coastal stewardship. Sections 312 and 315 of the CZMA of 1972, as amended, require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance reviews of federally designated National Estuarine Research Reserves. This document describes the evaluation findings of the Director of NOAA's Office of Ocean and Coastal Resource Management with respect to the operation and management of the Jacques Cousteau-Mullica River National Estuarine Research Reserve (JCNERR) by the State of New Jersey during the period from November 1997 through September 2003. This is the first performance review for the JCNERR since its designation in November 1997. This document includes an evaluation summary, program review procedures, a program description, accomplishments, recommendations and a conclusion.

The recommendations made by this evaluation appear in **boxes** and follow the relevant section of findings. This review contains recommendations in the form of program suggestions. **Program Suggestions** describe actions that NOAA believes the state should take to improve the program but are not currently mandatory. Program Suggestions that are reiterated in consecutive evaluations due to continuing problems may subsequently be elevated to Necessary Actions. If no dates are indicated, the state is expected to address the recommendations by the time of the next Section 312 program review. NOAA will consider the findings of this evaluation when making future financial award decisions regarding the JCNERR.

## II. PROGRAM REVIEW PROCEDURES

### A. OVERVIEW

NOAA began its programmatic review of the JCNERR in June 2003. The Section 312 evaluation process involves four distinct components:

- An initial document review and identification of specific issues of particular concern;
- A site visit to the JCNERR, including interviews and a public meeting;
- Development of draft evaluation findings; and
- Preparation of the final evaluation findings, partly based on comments from the state regarding the content and timetables of necessary actions specified in the draft document.

## **B. DOCUMENT REVIEW AND ISSUE DEVELOPMENT**

The evaluation team reviewed a wide variety of documents prior to the site visit, including: (1) the federally-approved Final Environmental Impact Statement and JCNERR Management Plan; (2) financial assistance awards and work products; (3) semi-annual and annual performance reports; (4) official NOAA correspondence; (5) research and education grant proposals; and (5) publications, work products, and outreach materials.

Based on this review and on discussions with the Office of Ocean and Coastal Resource Management's (OCRM) Estuarine Reserves Division, the evaluation team identified the following issues to discuss during the site visit:

- The status of carrying out and reporting progress toward grant tasks and implementation of the Reserve's management plan;
- The status of facilities and resource management and stewardship at the Reserve;
- The status and effectiveness of the Reserve's staffing, programs, and participation in national research, monitoring and education programs;
- The visibility of the Reserve's research, monitoring and education programs;
- The manner in which the JCNERR coordinates with the New Jersey Coastal Management Program, as well as other federal, state, and local agencies and programs; and
- The status of the Reserve's management plan revision.

## **C. SITE VISIT TO NEW JERSEY**

Notification of the scheduled evaluation was sent to the New Jersey Department of Environmental Protection (NJDEP), Rutgers University Institute for Marine and Coastal Sciences (IMCS), JCNERR, relevant federal environmental agencies, and the offices of New Jersey's U.S. Congressional members. In addition, a notice of NOAA's "Intent to Evaluate" was published in the *Federal Register* on June 25, 2003.

The site visit to New Jersey was conducted on September 22-25, 2003. Ms. Elaine Vaudreuil and Mr. Ralph Cantral, Evaluation Team Leaders, OCRM National Policy and Evaluation Division; and Ms. Kate Barba, JCNERR Program Specialist, OCRM Estuarine Reserves Division, composed the evaluation team.

During the site visit, the evaluation team interviewed JCNERR staff, senior Rutgers University, NJ Department of Environmental Protection and other state officials, federal agency representatives, coastal researchers, environmental educators, civic group

representatives and private citizens. Appendix A lists people and institutions contacted during this review.

As required by the CZMA, NOAA held an advertised public meeting on September 23, 2003, at 7:00 p.m., at the Jacques Cousteau Coastal Education Center, 182 Great Bay Boulevard, Tuckerton, New Jersey. The public meeting gives members of the general public the opportunity to express their opinions about the overall operation and management of Reserve. No individuals registered to speak at the meeting and no written comments were received.

The crucial support of JCNERR staff with the logistics and planning of the site visit is gratefully acknowledged.

### **III. RESERVE PROGRAM DESCRIPTION**

#### **A. THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM**

The Coastal Zone Management Act of 1972, as amended, established a system of National Estuarine Research Reserves that are funded cooperatively by NOAA's Office of Ocean and Coastal Resource Management and the host states or territories, which also manage the reserves. The Reserve Program has two primary missions: (1) to establish and maintain, through federal and state cooperation, a national system of reserves representative of various biogeographic regions in the U.S.; and (2) to conduct long-term research, educational and interpretive activities in support of national coastal zone management priorities.

Toward those missions, reserve sites are selected to represent the range of biogeographic regions, estuarine types and coastal management challenges occurring throughout the U.S. To date, NOAA has designated 26 National Estuarine Research Reserves that collectively protect more than one million acres of estuarine land and water. Two additional sites are currently in various stages of the designation process.

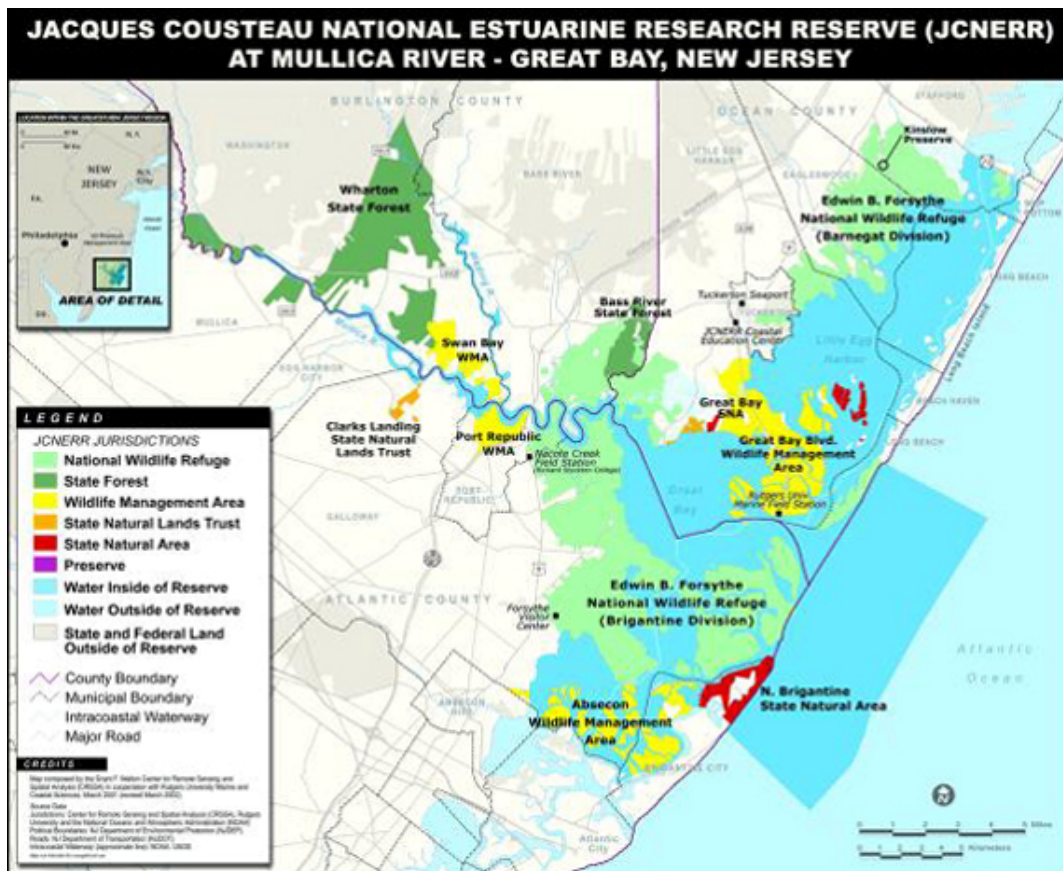
#### **B. THE JACQUES COUSTEAU NATIONAL ESTUARINE RESEARCH RESERVE AT MULLICA RIVER**

The Jacques Cousteau National Estuarine Research Reserve encompasses more than 110,000 acres in southeastern New Jersey, including a great variety of terrestrial, wetland and aquatic habitats within the Mullica River-Great Bay ecosystem. The Reserve is comprised of federal and state lands managed in partnership through a variety of agencies. With little more than 1% of the Reserve subjected to land development, this area is regarded as one of the least disturbed estuaries in the densely populated urban corridor of the Northeastern United States.



## 1. Reserve Site Description

Located just north of Atlantic City, NJ, the Mullica River-Great Bay estuary lies within the New Jersey Pinelands forest ecosystem, which offers high ecological value and special protections for the a large portion of the watershed. Representing the Mid-Atlantic/Virginian bio-geographic sub-region, the reserve offers a wide range of different habitats, including upland pine-oak forests, lowland Atlantic white cedar swamps, freshwater marshes, salt and freshwater tidal marshes, barrier islands (including sandy beaches and dune habitats), shallow bays and the coastal ocean. The Reserve encompasses the relatively pristine Mullica River-Great Bay system, a portion of the more developed Barnegat Bay system, and an area that extends beyond Little Egg inlet into the Atlantic Ocean.



Great Bay/Mullica River: Great Bay is a major migratory stop and wintering area for many waterfowl, shorebirds and raptors. There are at least 44 distinct water bird nesting colonies for fifteen different species. The piping plover, a federally-listed threatened species, nests within the Reserve's boundary, as well as the protected bald eagle and the peregrine falcon. The Mullica River-Great Bay area also supports 61 different species of finfish, including striped bass, alewife, and blueback herring which spawn in tributaries. Shellfish populations are also extensive, including clams and mussels.

Little Egg Harbor/Barnegat Bay: The Reserve includes a portion of Little Egg Harbor at the south end of Barnegat Bay. This area has experienced more development than Great Bay, particularly along the shoreline of Beach Haven West and on Long Beach Island. The north end of Barnegat Bay, adjacent to the New York metropolitan area, is densely developed and is experiencing rapid growth, and has potential to affect the Little Egg Harbor area of the Reserve. A portion of the JCNERR is within the boundary of the Barnegat Bay National Estuary Program.

Atlantic Ocean: JCNERR is the only reserve in the system with boundaries that extend seaward into the Atlantic Ocean. A long-term observation station (LEO-15) sits on the continental shelf in 15-feet of water, and is designed to record changes in the coastal ocean, such as temperature variability and sediment transport.

## **2. Reserve Administration**

NOAA designated the JCNERR in November 1997. The Rutgers University Institute of Marine and Coastal Science (IMCS) is responsible for the operation and management of the reserve. The JCNERR operates under an integrated management approach among institutional landholders within the reserve, including the NJ DEP, US Fish and Wildlife Service (USFWS), Richard Stockton College of New Jersey, the Pinelands Commission and the Baymens Museum. Rutgers IMCS, as the lead agency, receives federal financial assistance awards and has overall responsibility for reserve management.

The JCNERR Advisory Committee was established to make recommendations to the reserve manager on topics related to research, education and local government. It is made up of members representing the public landholders, reserve users and research, education and local government interests.

The Reserve headquarters office is located at the Rutgers University Cook Campus in New Brunswick, New Jersey. The Jacques Cousteau Coastal Education Center, adjacent to the Reserve in Tuckerton, serves as the hub for the Reserve's education and outreach programs.

## **IV. ACCOMPLISHMENTS, REVIEW FINDINGS AND RECOMMENDATIONS**

### **A. OPERATIONS AND MANAGEMENT of THE RESERVE**

The Reserve has made a great deal of progress in establishing its operational programs since its designation in November 1997. The Reserve, in large part because of the guidance of the manager and teamwork of its staff, has achieved effective integration of research, training, education programs, and has integrated technology into its delivery of information and services to local decision-makers and educators. The Reserve has also made good use of capabilities within Rutgers University to support the Reserve, including the center for remote sensing, the marine field laboratory, and the Office of Continuing Education.

#### **1. Administration**

##### **a. Organizational Position**

The Reserve, administered by the Rutgers IMCS, is well-positioned to accomplish its mission. The Reserve Manager serves as Senior Associate Director of the Institute. As such, the manager has access to the Institute's administrative services, the marine field station/laboratory, geographic information databases and spatial analysis tools of the Rutgers University Center for Remote Sensing and Spatial Analysis, and to students and faculty for conducting estuarine research within the Reserve. NOAA recognizes the Institute's strong support for the Reserve program prior to and since its designation.

The Reserve, through Memoranda of Understanding, has a formal relationship with a number of partner organizations in the management of the Reserve. These partnerships are described in more detail below under "Advisory Committees", and in section D, "Resource Management and Stewardship". NOAA encourages the Institute to ensure close coordination with the Reserve's partner organizations, particularly the New Jersey coastal program within the Department of Environmental Protection, in designing and carrying out its research, education and coastal training programs.

##### **b. Staffing**

NOAA recognizes the high quality and professionalism of the Reserve staff and commends the manager for building a talented and well-integrated team. NOAA also commends Rutgers IMCS for its support for filling the staff positions needed to effectively carry out the Reserve's programs. The review team finds that the Reserve has implemented the required staff roles for reserve administration, research and monitoring, education, training and interpretation, and that surveillance and enforcement is adequately provided by the various land-holding agencies within the Reserve.

Following its designation, the reserve quickly filled key staff positions, including the Reserve manager, education coordinator and research coordinator. The reserve has fully staffed the positions outlined in the management plan, and has hired additional staff, full or part time, to implement the Reserve's research, monitoring, education and watershed/coastal training programs.

The Reserve has added more positions to carry out the Reserve's management plan, accommodate expansion of system-wide programs, and meet growing demand for the Reserve's services within the local community and the state. The Reserve added a full-time assistant manager, watershed coordinator to manage the Coastal Training Program, research technician to carry-out monitoring in accordance with system-wide guidelines, and an interpretive docent for the Reserve's exhibits. The Reserve has also filled several positions on a part-time or cost-shared basis, including: a GIS coordinator, a volunteer coordinator, an administrative assistant for grant and performance reporting, a web designer/programmer, a watershed coordinator to expand coastal training opportunities to Sandy Hook, a program specialist to organize seminars for legislative staff, and Graduate Research Fellows.

As the Reserve has built and implemented its programs, the Reserve manager has recruited staff that work well across disciplines. As a result, the Reserve has done an excellent job of integrating research into its education, training and outreach programs. The needs of coastal decision-makers have also informed the priorities within the research program, such as the need for additional monitoring within the Barnegat Bay portion of the Reserve. The Reserve is encouraged to continue supporting this multi-disciplinary team approach in the design and implementation of its programs.

**1. ACCOMPLISHMENT:** The Reserve manager, with support from Rutgers IMCS, has built a highly skilled, professional and effective team to operate the Reserve's programs. The Reserve staff is commended for their teamwork and interdisciplinary approach to carrying out the Reserve's programs.

The JCNERR staff shares time between offices at the Rutgers University campus in New Brunswick and the Coastal Education Center in Tuckerton. The Reserve manager, assistant manager, research coordinator, education coordinator, and administrative assistant share time between the two facilities, but are based primarily out of the IMCS headquarters office, which is located at Rutgers University's Cook Campus in New Brunswick. The GIS coordinator, part of Rutgers Center for Remote Sensing and Spatial Analysis (CRSSA), is also located in New Brunswick. The watershed and volunteer coordinators are permanently located at the Coastal Education Center in Tuckerton, which serves as the hub for the Reserve's education and outreach programs. The SWMP technician and part-time interpretive docent are also based in Tuckerton, operating out of the Rutgers field station and the Visitors' Center respectively.

The distance between the New Brunswick office and Coastal Education Center in Tuckerton is approximately 1.5 hours by car. Staff members travel regularly between the two locations, particularly those staff that are located in New Brunswick. The distance between the two locations does not appear to affect the Reserve's ability to implement core programs. However, the lack of a full-time management presence at the Coastal Education Center places day-to-day management and operational responsibilities on the watershed and volunteer coordinators when senior managers are not present. This management responsibility places an additional duty on the already full programmatic workload of these staff.

**1. PROGRAM SUGGESTION:** The Reserve is encouraged to have a senior management presence in Tuckerton at the Coastal Education Center on a full-time or rotational basis to oversee day-to-day operations at the field location.

#### c. Finance and Performance Reporting

The Rutgers IMCS has received financial assistance awards since 1992, including development awards for conducting the Reserve's site nomination and selection process, and operation and construction grants to carry out the Reserve's approved management plan following its designation in November 1997. During the review period, the JCNERR received grants for: operations, education and monitoring; acquisition and construction; and system-wide funding to organize the NERRS annual meeting. The review team finds that the Reserve has adhered to cooperative agreements, has made substantial progress implementing the Reserve's management plan, and that the state has demonstrated its commitment, in terms of personnel and funding, to the program. The review team also finds that some improvements are needed in grant tracking and performance reporting.

#### Operations, Education and Monitoring Grants –

Under its operations grants, the Reserve has expanded the reach of its K-12 education program (MARE) to more than 40 school districts and to the mid-Atlantic Consortium on Science and Excellence in Education (COSEE); provided quality controlled system-wide monitoring data beginning in 1996; created a training facility for teachers and coastal decision-makers; and designed and installed interpretive exhibits. The Reserve also became an early participant in a National Estuaries Day event, EstuaryLive!, conducting live internet broadcasts to schools from the field to raise awareness of the importance of coasts and estuaries.

Rutgers IMCS has demonstrated its support by filling key staff positions quickly and providing the 30% state matching share for the operations grant. As match, Rutgers provides administrative services and staff support to the program, while waiving most of the charges it would collect under the university's negotiated rate for indirect costs. Among these services, Rutgers provides: the salary of the program manager, part time

support for the education, research, and GIS coordinators, program specialist, and program coordinator; administrative support, including secretarial support and financial management; facility space at the IMCS building, including staff offices and laboratory space; boats and laboratory facilities at the Rutgers Marine Field Station; and support of the Center for Remote Sensing and Spatial Analysis in the form of staff time, access to data sets, and equipment.

As the Reserve's programs have grown, support for many of the new positions has been provided by the Federal share of the grant. These positions enable the Reserve to carry out new or expanded program activities, including system-wide efforts such as the Coastal Training Program or expansion of the System-wide monitoring program. The Reserve has focused on delivering services to a broader audience (i.e. more schools participating in education programs; more communities served by coastal training). As the demand for these services increases, the Reserve faces the challenge of maintaining existing programs while developing new initiatives or expanding to serve more localities.

To maximize its funding, the Reserve has looked for opportunities to leverage additional support from other funding sources. The Reserve has been successful in finding additional sources of programmatic funding and in cost-sharing positions with other programs. For example, the JCNERR has received additional support from private organizations, such as the Geraldine R. Dodge Foundation, to conduct and evaluate education programs. Also, the Reserve has funded a new administrative assistant on a 50% cost-share basis with another Federal grant for the purposes of grant management and performance reporting.

#### Acquisition and Construction Grants —

With its construction and acquisition grants, the Reserve secured a site for the education/training/research/dormitory complex; designed and constructed the Coastal Education Center; and constructed the joint Visitor's Center and interpretive exhibits, in partnership with the Tuckerton Seaport. The match for these projects was provided in the form of donated land, project management services of Rutgers University's facilities construction office, and in-kind salary support. The Reserve has received several grants to construct laboratory space at the Reserve, including an outdoor wetlab for research and hands-on training. The Reserve reprogrammed some of these funds as its plans for expanding the Coastal Education Center to accommodate growth in the education, training and research programs have evolved. See additional discussion of the Reserve's accomplishments and future plans under its facilities plan under section A.2, "Facilities".

<p><b>2. ACCOMPLISHMENT:</b> Rutgers IMCS is to be commended for its continued support of the JCNERR, particularly in providing staff and resources within the University to support the development and implementation of the Reserve's management plan, research, education and training programs.</p>
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## Grant tracking and performance reporting –

NOAA requires semiannual and final performance reports for each financial assistance award. The reports are to provide a status of activities funded under each award. The reserve has achieved the desired results from the funded tasks and has continued to build upon previously completed projects. NOAA encourages the JCNERR to continue this excellent progress. The review team finds, however, that improvements are needed in the timeliness of and detail provided in performance reports.

During the evaluation period, the Reserve was consistently late in submitting its semi-annual performance reports to NOAA. Performance reports also contained information that overlapped between performance periods or between activities funded under other open awards, making it difficult to track progress under each financial assistance award. The Reserve has acknowledged that this is an area for improvement and noted that it has already taken steps to address this concern. Specifically, the Reserve has hired an administrative assistant, on a cost-shared basis, for grant management and performance reporting. The review team also recognizes the Reserve's concern about, and desire for, consistent guidance and feedback from NOAA on the standards for performance reports. Because the information contained in performance reports is important for NOAA to track progress, NOAA encourages the JCNERR to submit timely and informative performance reports. The review team recognizes and commends the Reserve for the meaningful steps it has already taken to address this concern.

**2. PROGRAM SUGGESTION:** The program should improve the timeliness of its performance reports and work with NOAA to clarify expectations regarding the level of detail to be provided within the reports. NOAA agrees to provide clearer guidance to the Reserve regarding the level of detail required in performance reports.

### d. Advisory Committees

The Reserve management plan establishes a Reserve Advisory Committee to provide for effective coordination and cooperation among all interests involved with the Reserve and to advise Rutgers-IMCS on issues related to research, education and resource management at the Reserve. The management plan established three subcommittees – Research, Education and Local Government – under the Advisory Committee. A Landholders Coordinating Committee was also established as part of the Memorandum of Understanding between Rutgers IMCS, NJ DEP, the U.S. Fish and Wildlife Service and Richard Stockton College.

The Reserve Advisory Committee and its subcommittees have met periodically since the Reserve's designation. Each of the subcommittees is comprised of dedicated individuals that assist the Reserve in furthering its mission and increasing its visibility.

The subcommittees have actively engaged the reserve's partners in planning for the research, education and coastal training programs. Their work is discussed in the sections of the document that pertain to each of those programmatic areas. The Reserve is commended for engaging the subcommittees in long-term planning for these programs.

The Reserve has engaged many members of the full Advisory Committee in the course of regular business, and most representatives of the member organizations that were interviewed felt that the level of coordination was adequate. However, in some cases, there has been little contact between committee meetings, which take place approximately once per year. The review team suggests that the Reserve more actively engage the full Advisory Committee in planning processes, particularly for the 5-year update of the JCNERR management plan, to ensure ongoing coordination among all partners.

As part of the management plan update, the review team suggests that the Reserve and the Advisory Committee explore the need for formal changes to the structure and schedule of the committees. Regarding the schedule, the review team notes that the Reserve's management plan and memorandum of understanding established an ambitious meeting schedule for two committees and three subcommittees, calling for them to meet on a quarterly basis or more frequently. As a practical matter, it is difficult and costly to convene two full committees and three subcommittees quarterly. The role of the Advisory and Landholder Coordinating committees is to set long-term direction for the program. As such, it may be appropriate and more feasible for the full Committee to meet less often than the current management plan requires, for example, twice a year.

Operationally, two changes have taken place within the committee structure, regarding the local government subcommittee and the Landholders Coordinating Committee. In 2001, the local government subcommittee was changed to focus on the Reserve's coastal training program and delivery of information and tools to coastal-decision-makers. This change appears consistent with the original charge of the local government subcommittee to ensure that the Reserve's projects are consistent with local needs and to provide advice on local issues and opportunities.

The Landholders Coordinating Committee was established under the Memorandum of Agreement between Rutgers IMCS, NJ DEP, the U.S. Fish and Wildlife Service and Richard Stockton College to "guide programs within the reserve to assist in the education and research objectives of the members" with advice of the Reserve Advisory Committee and subcommittees. The review team noted that the Committee's membership and purpose is very similar to that of the Reserve Advisory Committee, as stated in the management plan and MOU, and that the Committee has been inactive. The Reserve may wish to consider ways to streamline the structure of the committees, while providing a formal mechanism for ongoing coordination between landholders, for example, by formally merging the two committees, or creating a subcommittee of landholders within the Reserve Advisory Committee.



**3. PROGRAM SUGGESTION:** NOAA encourages the JCNERR to: 1) engage the Reserve Advisory Committee in planning, particularly in the review and update of the 5-year management plan and to provide an ongoing forum for coordination among Reserve partners, and 2) to explore the need for changes to the schedule and structure of the advisory committees as part of the 5-year management plan update to formalize operational changes that have taken place.

Subsequent to the site visit, the Reserve has indicated that it is planning to consider realignment and restructuring of advisory committees as part of efforts that are underway to revise the JCNERR management plan.

## **2. Facilities**

The Reserve has made significant progress toward implementing the facilities plan contained in the Reserve's management plan. As a newly designated Reserve, the plan detailed a strategy to meet short-term and long-term facility needs. In the short-term, the Reserve planned to use existing facilities where possible, including administrative space at the Rutgers IMCS building in New Brunswick, boats and laboratory space at the IMCS building and at the Rutgers University Marine Field Station, and education facilities at the Field Station and those of other partners. Over the long-term, the Reserve planned to use capital construction funds from NOAA and other sources to construct a combined research, education and office complex, as well as nature trails, boardwalks and boat ramps to facilitate compatible public access to the Reserve.

### **a. Coastal Education Center -**

During the review period, the Reserve secured a site for the combined research, education, and office complex in Tuckerton, adjacent to a dorm facility for the Rutgers Marine Field Station. The Reserve, through the Rutgers University construction office, contracted for architectural and engineering plans for the complex. The Coastal Education Center was dedicated in October 2000. It serves as an adult training center for the Reserve's K-12 professional development (teacher training) programs and the Coastal Training Program. The building contains offices for the education coordinator, stewardship coordinator, volunteer coordinator, a library, a distance-learning classroom with a seating capacity of 40, and a 16-bed dormitory for visiting teachers or researchers. In 2003, the Reserve also completed construction of an outdoor wetlab, which is available to researchers and for hands-on learning by teachers and students, particularly those participating in the MARE education curriculum.

As research programs at the University and the Reserve's programs have grown, laboratory and office space has become scarce at IMCS and the Rutgers Marine Field Station. Growing demand for coastal training and decision-maker support in Tuckerton will also present challenges for space at the Coastal Education Center. IMCS is encouraged to update its facility plan as part of the revised 5-year management plan for

the Reserve and reaffirm state agency commitment to provide facilities for the Reserve's research and monitoring programs.



JCNERR Coastal Education Center<sup>1</sup>



Dedication of the  
Coastal Education Center

b. Visitor Center –

The Reserve also designed and constructed an interpretive exhibit titled “Life on the Edge”, which was dedicated in July 2002. The exhibit is located on the top floor of the Tuckerton Seaport Yacht Club building (modeled after the old Tuckerton Yacht Club), which is located near the Coastal Education Center. As part of the Reserve's management plan, the Reserve entered into an agreement with the Barnegat Bay Decoy and Baymen's Museum to combine funds for the construction of a joint visitors/interpretive center in order to increase the visibility of and visitation to the Reserve's exhibits, while also attracting visitors to the Tuckerton Seaport. The project also benefited from sharing visitor parking, staff parking and restrooms with the Baymen's Museum exhibits. The Reserve has an Interpretive Docent on-site to guide visitors, answer questions, and ensure that displays remain in good working order.

The Education and Interpretation subcommittee was actively involved in setting guidelines for the exhibits, soliciting proposals from exhibit vendors, and working with the vendor throughout development of the exhibits. The exhibits, designed for the general public and K-12 school children, give visitors an overview of the Reserve, promote knowledge of habitats within the Reserve, and involve visitors in computer-based role-playing scenarios to engage them decision-making and stewardship of coastal resources. The exhibit has been very popular among tourists and school groups. Its popularity has, at times, presented a challenge for staff at the facility. The Reserve is exploring ways to recruit additional volunteer support to staff the interpretive exhibits.

The Reserve's progress in developing facilities during the review period is commended, particularly its partnerships within IMCS and with the Baymen's Museum to share land and facilities. The Coastal Education Center and Visitors Center have significantly contributed to the institutionalization and visibility of the Reserve's

programs. NOAA encourages the reserve to continue enhancing its facilities to meet future needs as opportunities arise.

**3. ACCOMPLISHMENT:** The Reserve has achieved a great deal of progress in implementing the Reserve's facilities plan since the Reserve's designation, including the design and construction of education, research and office facilities at the Coastal Education Center, a joint Visitors Center, and interpretive exhibits.

### 3. Management Plan

The Reserve has made significant progress toward implementing the administrative plan, facilities development plan, education, interpretation and outreach plan, and the research and monitoring plan contained in the Reserve's 5-year management plan. These accomplishments are described in the corresponding sections of this document. The management plan, the Reserve's first plan, laid out a very broad and ambitious scope of activities for a 5-year period. The management plan is due to be updated this year. The review team commends the Reserve for conducting a 5-year retrospective and taking a hard look at what has been accomplished, given lower priority, or put on hold. This retrospective will be valuable in updating the management plan and revising milestones for the next 5 years.

Recognizing the progress the Reserve has accomplished and the efforts that were given lower priority, NOAA strongly encourages the Reserve to engage its partners in long-term planning through the 5-year management plan revision process. In particular, NOAA encourages the Reserve to engage the Advisory Committee in these deliberations.

**4. ACCOMPLISHMENT:** Since its designation, the Reserve has made significant progress toward implementing its 5-year management plan, particularly: the administrative plan; facilities development plan; education, interpretation and outreach plan; and the research and monitoring plan.

**4. PROGRAM SUGGESTION:** In updating its management plan, which is due this year, the Reserve is encouraged to engage the Reserve Advisory Committee in long-term planning for Reserve's program priorities, facilities needs, and watershed protection efforts, to clarify the structure of advisory committees, and to set realistic milestones for progress in these areas over the next 5 years.

### 4. State Program Coordination

As part of its review, NOAA may consider whether the Reserve coordinates with its state coastal program, particularly whether it identifies priorities among coastal management issues that should be addressed through coordinated research within the

system. NOAA may also consider whether the Reserve provides information to other state or local entities involved in coastal management issues.

a. Coordination with New Jersey Coastal Management Program

The New Jersey Coastal Management Program, within the NJ DEP, oversees coastal land use planning, stormwater management, regulation of flood hazard areas, tidal and freshwater wetlands, and coastal development permitting under New Jersey's Coastal Area Facilities Review Act (CAFRA). The coastal program is networked among several offices within DEP, with overall policy development and coordination housed within the Office of Policy, Planning and Science. The Land Use Regulation office is responsible for regulatory reviews and permitting.

The JCNERR and the coastal program have worked together to sponsor coastal decision-maker workshops on such issues as submerged aquatic vegetation. The Reserve works with the Land Use Regulation Office to provide scientific information for decision-making, but overall, the review team finds that there has been little interaction between the Reserve and the coastal program's policy office the past few years. The coastal program has contributed funding for some of the Reserve's decision-maker workshops and looks to the Reserve for logistical support, since the coastal program lacks the capacity to organize the workshops. For example, the Reserve conducted a workshop on the scientific research and spatial data available for the abundance and distribution of submerged aquatic vegetation (SAV) in the bay, which helped the land use permitting staff understand the importance of taking SAV into consideration when making permitting decisions.

The review team finds that there is a large unmet need for coastal training, particularly for municipal officials, on management techniques for coastal areas. As an example, the state has drafted new stormwater management regulations that will require municipalities to do more with little additional funding. Through its coastal training program, the Reserve is well positioned to work with local governments along the coast (33 in Ocean County alone) to educate them on management measures that can be used to address stormwater runoff. The coastal program recognizes that there is a need for guidance and training for municipal officials (i.e. sharing model ordinances that are appropriate to varying soils across state), and wants to ensure that technical assistance to local officials on stormwater management techniques is consistent with DEP's coastal permitting requirements. The review team finds that improved communication and coordination between the coastal program, Reserve, Sea Grant program and others providing information to coastal decision-makers, particularly about model ordinances that meet New Jersey's coastal permitting requirements, would help increase consistency and efficiency in delivery of coastal training to decision-makers. NOAA plans to consider this issue of how technical guidance and information is delivered to coastal decision-makers in its programmatic review of the NJ coastal program.

In the area of permitting, the Reserve has very little involvement with DEP's review of proposed developments under CAFRA. The Reserve generally engages these issues from a scientific perspective and through its coastal training work with local governments. The Reserve conducts a great deal of research on coastal issues, has a unique capacity to bring a science-based perspective to management issues, and engages decision-makers, such as the coastal program's planning and permitting staff, through training workshops or other science-based technical assistance. Currently, however, the Reserve is not directly notified of pending permit applications under review near the Reserve and thus does not provide information on individual projects. See section D for additional discussion on this topic.

#### b. Coordination with Other Entities Involved in Coastal Management

The review team interviewed representatives from a number of organizations involved in coastal management in coastal New Jersey, including several land-holding partners of the Reserve as well as local governmental officials. The Reserve was complimented for its research, education and training efforts and for its willingness to share information and collaborate.

The Reserve has been particularly involved with the Barnegat Bay National Estuary Program (NEP). The Reserve boundary extends into Barnegat Bay, at Little Egg Harbor, and overlaps with the Barnegat Bay NEP planning area. The Reserve also has an interest in planning efforts around the northern section of the bay, though not in the Reserve's boundary, because these waters flow into the Reserve. The Reserve manager, watershed, GIS and research coordinators have been very active in the Scientific and Technical Advisory Committee of the Barnegat Bay NEP. Specifically, the Reserve manager serves as Chair of the Science Committee and the Reserve's Research Coordinator was the principal author of the Barnegat Bay Characterization. The Reserve has added sampling stations for its System-wide monitoring program within the Little Egg Harbor portion of Barnegat Bay. In 2002, the Reserve sponsored a monitoring workshop with the NEP to foster collaboration in monitoring efforts within the Barnegat Bay estuary. In the education arena, the Reserve's Education Coordinator has participated on the Barnegat Bay Estuary Roundtable to exchange ideas and share education programs.

The Reserve noted that it has had a difficult time partnering with the NJ Sea Grant program, but would like to become more engaged with them, along with the NJ coastal program, in coordinating their programs to address issues of mutual interest and concern. This coordination will become particularly important as the Reserve becomes more engaged in coastal training out of Sandy Hook, at the northern end of Barnegat Bay.

Subsequent to the site visit, the Reserve has indicated that the JCNERR watershed coordinators have begun to meet regularly with new staff members of the New Jersey coastal program to maintain regular communication and coordination with the NJDEP.

**5. ACCOMPLISHMENT:** The Reserve is commended for its mutually-beneficial work with the Barnegat Bay NEP, which reflects effective coordination and efficiency between programs in carrying out responsibilities in a shared management area. This work is important for increasing scientific and public understanding of the relationship between development patterns and the condition of the bay.

**5. PROGRAM SUGGESTION:** The Reserve is encouraged to help facilitate improved communication and collaboration among the New Jersey coastal program, Sea Grant program, and the Reserve on issues of mutual concern, particularly regarding delivery of training and technical assistance for county and municipal officials on coastal issues, such as stormwater runoff and other land-based sources of pollution.

## **5. Contributions to System-wide Planning**

### **a. NERRS Strategic and Annual Planning**

The review team also acknowledges the Reserve's contributions to the national system through its continued participation on various planning committees within the system. Among them, Reserve staff participated in development of the NERRS Action Plan, which outlines the system-wide activities planned for the next 5-years, as well as plans or protocols for system-wide initiatives, such as expansion of the System-wide Monitoring Program, implementation of the Coastal Training Program, habitat restoration science, and planning for EstuaryLive (a live internet broadcast education program for National Estuaries Day). The Reserve's Education Coordinator, for example, served for three years as the Education Representative to the NERRS Action Plan workgroup. The Reserve manager also contributed to the System through his service for two years as Vice Chair and two years as Chair of the National Estuarine Research Reserve Association, representing the state managers within the Reserve System.

### **b. NERRS Annual Meeting**

In October 1999, JCNERR hosted the National Estuarine Research Reserve System annual meeting. The annual meeting provides a forum for Reserve System managers, education coordinators, and research coordinators as well as NOAA staff to discuss national initiatives and review the system's strategic planning efforts. JCNERR coordinated all logistics for the 4-day conference as well as optional field trips held prior to the meeting. The review team acknowledges the valuable support of JCNERR staff with the logistics and planning of the annual meeting.

**6. ACCOMPLISHMENT:** The Reserve is commended for its continuing support for system-wide planning for the NERRS while carrying out a full load of core program activities at the Reserve. NOAA recognizes the initiative and dedication of the JCNERR staff in performing both functions.

## **B. RESEARCH AND MONITORING**

The review team finds that the Reserve has made significant progress in implementing its research and monitoring plan. The JCNERR conducts research and monitoring on the physical, chemical and biological components of the site estuaries and neighboring watersheds. The program is focused on several areas: nutrients, benthic habitat studies (including sediment composition and aquatic vegetation), and fishery productivity. The goal of this research and monitoring is to improve scientific understanding of the processes and functions of estuarine ecosystems, and to provide a long-term record of changes in environmental conditions throughout the Reserve. This data is intended to inform coastal decision-makers in addressing resource management challenges in the Mullica River/Great Bay estuary and in other estuarine systems around the country.

### **1. Research Advisory Committee**

The Reserve's Research and Monitoring subcommittee consists of approximately 12 members representing the scientific and academic communities, including researchers from Rutgers University, Stockton College, and the Pinelands Commission. Its role is to advise the Reserve Advisory Committee on priorities for research and monitoring activities and to evaluate the Reserve's effectiveness in achieving research and monitoring goals. The Subcommittee strives to meet twice a year, and had recently met for a full day of planning. Through the subcommittee, the Reserve has ensured effective coordination between scientific institutions in the watershed and coastal region.

### **2. System-wide Monitoring Program**

The JCNERR has successfully implemented the NERRS System-wide Monitoring Program. The Reserve has submitted continuous, quality-controlled data since 1996 at three monitoring stations using the SWMP data loggers and standard protocols, measuring temperature, salinity, dissolved oxygen, pH, and tidal variation in water levels at 30-minute intervals within the Mullica River-Great Bay estuary system. In 2002, the Reserve added two more monitoring stations, including one in Barnegat Bay at Little Egg Harbor. A peer-reviewed, scientific paper on the Reserve's water quality monitoring program was published in the Bulletin of the New Jersey Academy of Science in 2002.

The Reserve has provided the staff resources needed to ensure the quality of data generated at the monitoring stations and timeliness in submitting data to the NERRS Centralized Data Management Office. Increased staffing has allowed the Research Coordinator, who continues to oversee the implementation of SWMP, to focus on a broader range of research and monitoring priorities. The Reserve now has a full-time SWMP technician, half-time SWMP technical assistant, and support from Graduate Research Fellows. Reserve staff collects the water quality and nutrient data monthly from the data loggers and perform standard grab samples at the monitoring stations. The Reserve's SWMP technician also periodically performs equipment maintenance,

calibrates the data loggers to ensure that the data are accurate, and analyzes the data. Initially, staff at the Richard Stockton College (RSC) Marine Field Station maintained and collected data at the Mullica River/Nacote Creek monitoring station, while Reserve staff maintained those within the Great Bay. To ensure calibration among the data loggers, the Reserve's SWMP technician now maintains all of the SWMP data loggers.

In 2002, the Reserve acquired a new Campbell weather station, which is located on the Mullica River at the RSC Marine Field Station and is maintained by RSC staff. The weather station provides continuous data on temperature, relative humidity, wind speed and direction, barometric pressure, rainfall and solar radiation. Data from this weather station are submitted to the NERRS Centralized Data Management Office. The Reserve also has access to real-time weather data collected at the Rutgers Marine Field Station, located on Great Bay, and made available on the Rutgers University Coastal Ocean Observation Laboratory (COOL) website.

The Reserve has been also been working with the Barnegat Bay National Estuary Program to build out the monitoring network within the Barnegat Bay estuary and to ensure that the sampling stations provide data consistent with, and complementary to, that provided by the Reserve's monitoring stations. This cooperative effort will improve the understanding not only of the upper portions of Barnegat Bay, but also on the effect that urbanization is having throughout the bay. It will also provide valuable data for coastal decision-makers to inform their efforts to control polluted runoff into the bay.

### **3. Research activities**

Rutgers IMCS conducts extensive ongoing research on nutrients, phytoplankton, fisheries resources, and benthic habitats (including submerged aquatic vegetation). IMCS operates a Multi-nutrient analyzer that measures nitrate, phosphate and silicate concentrations in Great Bay. Combined with nutrient data from the SWMP monitoring stations, the Reserve is considering whether to expand its multi-nutrient sampling technology into the Little Egg Harbor portion of Barnegat Bay.

The Reserve is collecting samples of hard and soft bottom communities at its SWMP monitoring stations within the Mullica River–Great Bay estuarine system to determine the abundance, diversity and spatial distribution of species within benthic habitats. Beginning in 2002, the Reserve has collected samples (bottom grabs and cores) to characterize the composition and distribution of sediments (sand and organic matter) within the bay. IMCS also conducts seafloor mapping in the Reserve using side-scan sonar technology. IMCS is using a remotely operated vehicle, the Remote Environmental Monitoring Units (REMUS), to map the seabed to characterize topographic features and habitats within the estuary. The Reserve's effort to map submerged aquatic vegetation contributed to valuable coastal training for state and local decision-makers.



Rutgers also conducts fisheries population studies within the Reserve, including habitat utilization of clams and movements of finfish. The Reserve's research coordinator and education coordinator have teamed up to track the movements of striped bass in the estuarine system through an online database – StriperTracker.org. The Reserve has created a unique partnership that encourages members of the community to sponsor a fish, which covers the research cost of implanting a tag and engages the community in the Reserve's research efforts by enabling them to track the fish's movements.

With the presence of the Rutgers Marine Field Station, there is a great deal of research occurring within the Reserve. The review team noted the prolific research published by the Reserve's Research Coordinator, including a compilation of System-wide Monitoring data at many of the Reserves around the nation. The Reserve is commended for its level of research activity. The team encourages Rutgers to continue applying its research to management challenges in the coastal region.

#### **4. Site Characterization/Site Profile**

The Reserve System's implementing regulations require each reserve to develop an environmental monitoring program capable of detecting significant changes in reserve resources and ecosystems. Development of the program is comprised of three parts: (1) conducting baseline studies, (2) preparing a comprehensive site profile; and (3) implementing a long-term standardized monitoring program. The JCNERR began conducting its baseline characterization during the site designation process. The Reserve was able to draw upon spatial data and GIS capabilities within Rutgers University for this characterization. The Reserve, as discussed above, has made excellent progress implementing the long-term monitoring program using standard protocols and quality-control procedures. The JCNERR is making good progress toward completion of its site profile. The Reserve has completed a draft, and plans to complete the document in FY 2004. NOAA encourages JCNERR to continue its progress on the site profile and strive to complete it by September 2004.

#### **5. Geographic Information System**

The JCNERR is doing excellent work with Geographic Information System (GIS) technology in its research and coastal training programs. With support from the Rutgers University's Grant F. Walton Center for Remote Sensing and Spatial Analysis (CRSSA), the Reserve has been able to develop maps for the Reserve, many of which were instrumental in site selection and the environmental impact statement analysis for the Reserve's designation. The Reserve has developed a "Coastal Resource Repository", available on the Reserve's website, which incorporates data from various sources that coastal decision-makers can use to identify and analyze trends in spatial patterns. The repository provides access to boundary data for political jurisdictions and watersheds, topographic data, rivers and streams, land use and land cover data, satellite imagery, zoning, and transportation and sewer infrastructure, among other information.

The CRSSA is also assisting the Reserve with a buildout analysis of the Mullica River watershed and the Barnegat Bay watershed; analysis of land cover in New Jersey using satellite data; and mapping submerged aquatic vegetation and Brown Tide in Little Egg Harbor, within Barnegat Bay. The Reserve is commended for its support of a GIS coordinator position, for an effective partnership with the CRSSA, which leverages a tremendous amount of data and expertise for the Reserve, and for its efforts to integrate research into its training and outreach programs. NOAA encourages the JCNERR to continue its collaborative GIS work with the CRSSA, and to seek opportunities to collaborate with the New Jersey DEP on assessments of the cumulative impact of land use and land cover change in New Jersey's coastal area.

**7. ACCOMPLISHMENT:** The Reserve has made substantial progress implementing its Research Plan, particularly in its implementation of the System-wide Monitoring Program, completion of the Reserve's site characterization, progress on the site profile, support for the Barnegat Bay monitoring and science effort, and its effective integration of GIS capabilities in its research and training programs.

### **C. EDUCATION, TRAINING, INTERPRETATION AND OUTREACH**

The review team finds that the Reserve has been extremely involved and proactive in formal education, training for coastal decision-makers and outreach since its designation. The manager has provided consistent support, vision and resources to recruit excellent staff and develop outstanding education and training programs.

The Reserve focuses its education and training programs primarily on teachers and coastal decision-makers (i.e. local elected officials and municipal planners). In designing its programs, the Reserve recognizes the importance of building its education, training and outreach programs around the science behind specific coastal issues in the region, such as polluted runoff. By doing so, the Reserve is providing key audiences (the public and elected officials alike) with the information they need to make informed decisions about how land is managed or developed.

As an example, the Reserve has incorporated the issue of polluted runoff throughout its education, training and outreach programs. The Reserve, through the coastal training program, brought together scientists and municipal planners to assess the state of scientific knowledge about stormwater runoff, water quality monitoring data and alternative management practices that might be applied in a local area. In professional teacher development programs, the Reserve includes water quality investigations as part of its studies of coastal ocean, rocky shore and wetland habitats, and the teachers, in turn, involve students in water quality studies in the classroom. Finally, water quality is presented as a key theme in the Reserve's outreach exhibits, enabling visitors, whether student or general public, to relate land use patterns to the condition of water quality in coastal habitats, using the results of research studies and water quality monitoring.

The Reserve bases its programming on audience assessments, so that it can appropriately structure education and training activities, and evaluates activities to receive feedback on a program's impact, results and to guide program improvements.

## **1. Formal Education Programs**

### **a. Education Advisory Subcommittee –**

The Education and Interpretation Subcommittee of the Reserve Advisory Committee is made up of members of the Advisory Committee and other representatives from area educational institutions, state agencies involved with education, and area museums. The subcommittee's role is to recommend annual priorities for the reserve's education and interpretive activities; review proposals for educational and interpretive facilities, displays, training programs; and evaluate progress toward achieving priorities for education and interpretation. The subcommittee meets annually and has had a particularly active role in the development of the Life on the Edge interpretive exhibit.

### **b. Marine Activities, Resources and Education Program (MARE) –**

The JCNERR structured its education program on the premise that targeting teachers as a key audience in formal education increases efficiencies and the reach of the program, and that integrating coastal and ocean science across disciplines in primary and secondary school curricula is critical to enhancing ocean and coastal literacy. To this end, the JCNERR partnered with the Lawrence Hall of Science at the University of California Berkeley to implement the MARE program in pilot schools in New Jersey. MARE provides inservice training for teachers and school administrators, enabling them to integrate marine-based activities into existing curricula (including reading and math classes) at the Kindergarten through 8<sup>th</sup> grade levels. The program engages the whole school in learning about coastal and marine resources. The Reserve leveraged its financial support for MARE in New Jersey with approximately \$60,000 in funding from the Geraldine R. Dodge Foundation.

To date, the Reserve has helped establish the MARE program in approximately 50 schools across the state. Through intensive summer institutes, the Reserve conducts teacher training, leads teachers on field trips with hands-on research opportunities, and provides materials for a 10 week curricula. The Reserve also sponsors "Ocean Week", a whole school and community immersion event for participating schools or school districts. The Reserve has trained approximately 3,500 teachers, who are now actively involving Kindergarten through 5<sup>th</sup> grade students in ocean and coastal science and observation. According to evaluation data, 85 percent of teachers polled are using other non-text book methods, such as hands-on experiments or other activities, for teaching science, and 70 percent report a significant increase in student interest in science. "Ocean Week" has also been rated as a highly successful tool for involving students, teachers and community members in ocean science and related topics.



Teachers in MARE program, learning to collect samples with a seine and dissect clams.

School teachers and superintendents interviewed during the evaluation commended the Reserve for how quickly the program has grown, the willingness of Reserve staff to travel to school districts to conduct in-service activities, and the hands-on, one-day workshop offered for School Administrators. They noted the importance of providing materials for teachers, and recognize the level of effort needed to tailor MARE materials to local geography and local issues. They also noted an increased interest in school trips to Sandy Hook and Tuckerton, because students are interested in experiencing first-hand the things they've learned about in school.

The success of these education programs is fueling requests for guided tours of the Reserve and hands-on laboratory or field experiences, particularly by school groups who participate in MARE or visit the Reserve's exhibits. The Reserve staff is unable to accommodate the volume of these types of requests, and is exploring ways to better accommodate the interest in field visits, while maintaining its focus on teacher training. As options, the Reserve is considering: developing a driving tour of the reserve with maps and/or audio recordings as a guide; training volunteers to lead guided tours; and developing cost-reimbursable education programs at the Coastal Education Center that may ultimately provide longer-term financial support for continuing to expand professional teacher development programs.

#### c. Web-based Educational Tools –

The Reserve has developed web-based tools for teachers and students. The **COOL Classroom** incorporates an internet-based set of instructional modules that link middle and high school classrooms with active research investigations in ocean and coastal science. **The LEO 15 Observatory**, a long term research and monitoring program of Rutgers' IMCS, provides monitoring data, visualizations and information from the coastal shelf that is frequently used in classrooms. The JCNER education staff worked with scientists, museums and aquaria to implement **Striper Tracker**, a web-based monitoring program that enables interested parties to sponsor (tag) a striped bass that scientists are monitoring to determine migration patterns and movement in the

estuary. Through the website, StriperTracker.org, sponsors can track their fish as they migrate around the estuary, and learn about various habitats and water quality.

d. EstuaryLive! —

For three years, the Reserve, along with the Barnegat Bay National Estuary Program, has hosted the New Jersey segment of the NERRS EstuaryLive! program, a networked, internet-based field trip to estuaries. EstuaryLive! enables students and teachers to participate in live field trips at each of 5 different estuaries, which are broadcast live around the country via the internet. The field trips investigate estuarine habitats, the creatures that live there, and the importance of these estuaries to people. During the live field trips, participating students and teachers can email questions for a real-time response from field trip leaders. In 2003, this national program received more than 98,000 hits on the web site. The JCNERR Education Coordinator also plays a key lead role in planning EstuaryLive! at the national level.

e. Shore Bowl —

For the last three years, the Reserve education staff has taken a lead role in conducting the Shore Bowl, one of 23 regional academic competitions leading to the National Ocean Sciences Bowl. The Shore Bowl engages high school students in studying coastal and marine sciences and raises awareness of the importance of ocean science education among communities and school administrations. Up to 16 student teams in the region compete in a quiz on ocean science and related geography, history and literature. Winning teams earn the right to compete in the national competition, sponsored by the Consortium for Oceanographic Research and Education.

**8. ACCOMPLISHMENT:** The Reserve has made significant progress implementing its Education Plan, particularly in formal education, by successfully implementing MARE in 50 schools, training more than 3,500 New Jersey educators in a comprehensive professional teacher development and marine science education program; and establishing the *Life on the Edge* Interpretive Exhibit. The JCNERR has established itself as a leader in the Reserve system in using real-time data and technology in the classroom and in highlighting current research findings in education programs.

## 2. Training for Coastal Decision-makers

The JCNERR recognizes local officials and municipal staff as a key audience for training on how to apply coastal research, information tools, and state-of-the-art knowledge on management techniques to coastal management decisions. The Reserve has built a coastal training program that draws on its scientific expertise, assessment of the information needs of state and local decision-makers, and ability to deliver data through information technology (such as GIS) and workshops. Most of the Reserve's coastal training and professional teacher development programs operate out of the Coastal Education Center in Tuckerton, which is equipped with a small library, classroom

area that is wired for distance learning and video conferencing, a wet lab study area and dormitory facilities.

a. Local Government/Coastal Training Program Advisory Committee –

The Reserve Advisory Committee's Local Government Subcommittee, consisting of members representatives from area municipal and county governments, was established to review or recommend projects to ensure that they are consistent with local needs, and provide advice on opportunities for cooperative research, monitoring and education programs. In 2001, the local government subcommittee changed its focus to the Reserve's coastal training program and delivery of information and tools to coastal-decision-makers. The Coastal Training Program Advisory Committee has been actively engaged in the design and implementation of the Reserve's training program.

b. Coastal Decision-maker Workshops –

Following designation, the Reserve sponsored coastal decision-maker workshops as a part of the NERRS system-wide program to target professional audiences responsible for making decisions about coastal resources. The Reserve has conducted workshops each year to address a broad range of topics, using a phased approach to presenting research and scientific information on the topic, followed by policy issues or management options available to address the topic. The Reserve then incorporates relevant elements of issues, and science and management solutions into outreach for the general public and professional training for teachers.

For example, in 2000, the Reserve sponsored a workshop series that brought scientists and managers together to assess available research and management options regarding the impact of small motorized watercraft on shallow water habitats, particularly on bay grass. In 2001-2002, the Reserve conducted workshops for the NJDEP's land use permitting staff on research findings and management techniques available to reduce impacts to submerged aquatic vegetation. The Reserve also conducted a Beach and a Dune Maintenance workshop for municipalities, state parks, and private business owners with waterfront property that focused on the unique habitats, shoreline process and permitting requirements associated with beach and dune property.

In 2002 and 2003, the Reserve partnered with the Rutgers Office of Continuing Education for logistical support with coastal decision-maker workshops. The Continuing Education office coordinates training programs for municipal officials and others. Reserve staff worked closely with Office of Continuing Education to develop five courses targeted to municipal leadership and staff, which they will implement together in 2004. The Reserve provides funds to Continuing Education to reduce the registration fees for coastal decision-maker audiences. In some ways similar to a scholarship program, this approach fosters attendance by decision-makers, particularly in local governments, who might not otherwise be able to attend due to budget constraints.

### c. Coastal Training Program –

In 2003, the Reserve launched the Coastal Training Program, a NERRS system-wide program that enables Reserves to systematically assess the information needs of coastal decision-makers and support activities that inform decision-making around priority issues. The JCNERR successfully completed planning requirements for the program, including a market analysis of the training provider community and audience assessments, established a training advisory group, and developed a marketing plan and program strategy. The strategy builds on the Reserve's systems approach to program development, and establishes framework to deliver training over a five year period.

Based on the market analysis and audience assessments, the Reserve staff determined that land use issues, nutrient loading in watersheds, and environmental planning at the municipal and county levels continue to be key issues for the region. The program targets county, municipal and township leadership and staff as priority decision-maker audiences. Audience assessments indicated a need for workshops, supported by individualized technical assistance and follow-up, as critical to success. During interviews Reserve staff noted that it is most effective to tailor workshops, management tools and monitoring data to specific municipalities. However, because the process is extremely labor-intensive, the Reserve must limit the geographic scope of its activities.

The reserve has developed relationships with a number of local governments to provide ongoing technical assistance and training. For example, the Reserve staff has worked with Little Egg Harbor township officials to develop build-out scenarios to help decision-makers and citizens predict future development challenges and identify opportunities for open space conservation. Local leaders noted that having access to the Reserve's GIS resources and capabilities has increased their understanding of options for future growth of their community and helps the local government and citizens make more informed decisions. Representatives from Ocean County noted that the Reserve's Coastal Training Program, particularly its emphasis on stormwater issues, has been successful in reaching out to and engaging local governments in considering the impacts of various development options on the broader ecosystem. These representatives have observed increased press coverage of nonpoint pollution issues, and some increase in public awareness.

Leaders and staff of local governments expressed enthusiasm and gratitude for the Reserve's technical services and consistent follow-up, which has fostered a sense of credibility and trust over time. The Reserve is considered by these groups to be a "friend" and an asset. In fact, the Reserve's coastal training program coordinator was invited to attend a monthly meeting of the Mayors' association at which the Reserve and Barnegat Bay programs were discussed. Several local officials expressed particular interest in the Reserve's resource repository for coastal management information and technical resources, such as model stormwater ordinances. The Barnegat Bay NEP Director indicated an interest in working with the Reserve's research and education staff to integrate water quality monitoring data with stormwater management issues and

strategies to target additional municipalities in the Barnegat Bay NEP region. The Director has also used the JCNERR Research Coordinator's ecological characterization of Barnegat Bay extensively in policy and management outreach to the science and management community in the Bay region.

The Reserve Manager has begun to expand the geographic extent of outreach to decision-makers through the Coastal Training Program to the Sandy Hook and Bridgeton areas. The Reserve Manager has secured part-time staff assistance in Sandy Hook under an existing partnership with NOAA's National Marine Fisheries Service to focus on land use, nutrient loading and development. The part-time coordinator indicated that he was in the early stages of audience identification and program development. It will be critical to ensure regular support and oversight for expanding activity under the Coastal Training Program, to ensure that program development in these areas is consistent with the broader program and that mechanisms for monitoring and evaluation are established. The Manager has also initiated discussions with local government representatives in Bridgeton, southwest of the Reserve, to develop coastal training efforts that focus on agricultural land use, nutrients and planning for future growth and development.

Recently, the Reserve has begun to reach out to state legislators in their role as key decision-makers about coastal and ocean issues in New Jersey. The Reserve has begun to develop a legislative seminar series to present relevant scientific information on coastal issues as background for policy decisions that are coming before legislators. With part-time staff support, this program is in formative stages.

**9. ACCOMPLISHMENT:** Reserve staff has been effective in integrating the use of research, GIS tools, and training capabilities to support local governments in planning for compatible growth. The Reserve has also been very effective in increasing program efficiencies by partnering with the Rutgers Office of Continuing Education for management and logistical support for coastal decision-maker workshops.

### 3. Interpretation and Outreach

The Reserve's primary vehicle for interpretation and public outreach is the *Life on the Edge Exhibit* at the Tuckerton Seaport. The Tuckerton Seaport is a local development initiative that serves as a living history project to "preserve, present and protect maritime history, heritage and the environment of the Jersey Shore along with the contribution of its Baymen." The Seaport is working to establish itself as a tourist destination in the area. More than 5,000 school children visited the Seaport in the spring of 2003. The Life on the Edge exhibit is located in the "Yacht Club", one of the buildings that visitors move through first in visiting the Seaport. Close to the core area of the reserve, the Seaport is an ideal location to reach a high volume of visitors with information and interactive exhibits to promote knowledge of key habitats within the Reserve.



The exhibit serves as a gateway to the JCNERR. It incorporates a series of interactive elements designed to promote knowledge of habitats within the Reserve, communicate estuarine research findings, and engage visitors in decision-making and stewardship of coastal communities. The path through the exhibit immerses visitors visually in the various Reserve habitats, complemented with text, models of objects and creatures found in coastal habitats, and recorded sounds of the coastal environment. Throughout the exhibits, scientists narrate stories of their research investigations, the tools of the scientist, and ways that visitors can get involved as stewards of the coast. The exhibit promotes literacy through interactive displays, including a section on community involvement, role-playing as various community stakeholders with a stake in coastal resource management decisions, and interactive decision-making activities.

The reserve employs a part-time docent to manage the exhibits, provide additional interpretation, answer questions, and distribute materials about the Reserve and program opportunities for teachers. Several issues have surfaced during the first year of operation, primarily around managing the flow of school children and visitors, the need to slow the pace of hundreds of students moving through the exhibit, the importance of regular communication with Seaport partners as the overall Seaport project evolves, and the challenge of managing fee-based (the Baymen's Museum and Seaport) and non-fee (JCNERR) exhibits in the same building.

**6. PROGRAM SUGGESTION:** In light of growing demand for education, interpretive and training programs and limited staff resources, NOAA encourages the Reserve to remain focused and strategic in expanding these programs. It will be critical to ensure the level of capacity and infrastructure needed to support expansion of the geographic scope and the range of target audiences for education, training, interpretation and outreach.

#### 4. Volunteer Program

The Reserve has a small core of dedicated senior volunteers who support administrative functions at the Reserve's Coastal Education Center in Tuckerton and serve as interpretive docents at the Visitor's Center. The volunteer coordinator actively reaches out to recruit volunteers from the local community, particularly among new residents and retired citizens. This not only attracts volunteers for the program, but also raises residents' awareness of the coastal environment and the Reserve's presence in the community. The number of volunteer hours at the Reserve tripled from 200 hours in 1999 to approximately 600 hours in 2002.

The Reserve conducted volunteer training workshops for prospective volunteers in April 1999 and July 2000. In June 2000, the Reserve also hosted a volunteer dinner to celebrate a NOAA Environmental Hero Award and to recruit new volunteers. Volunteers have assisted with the Great Bay cleanup in partnership with the Ocean County Parks Department. Volunteer docents operate the profiling system for the Long-term

Ecosystem Observatory (LEO-15), 24 hours a day 7 days a week throughout the summer to ensure continuous sampling of the ocean environment at the LEO-15 platform. LEO-15 monitors ocean currents, sediment transport and other variables at a depth of 15 feet in the Atlantic Ocean just outside Little Egg Inlet. The Reserve also trained approximately 15 volunteers on techniques to monitor and report the health of tidal marshes in Little Egg Harbor and Barnegat Bay. However, due to limited staff and financial resources, the Reserve has not sustained this effort.

The Reserve plans to devote more attention to increasing the role of the volunteer program in the near future. Due to increasing demand for hands on experiences at the Reserve, the JCNERR staff is considering ways to train additional volunteers to serve as docents for the interpretive exhibits at the Visitors Center, and possibly to lead or accompany guided tours of the Reserve for school groups. NOAA encourages the JCNERR to continue to develop its volunteer program to assist with the Reserve's research, monitoring and education programs as well as to accommodate increased visitation to the new interpretive center. A strong volunteer program will help the Reserve meet increasing demand for hands on research and education experiences, and increased visitation at the Visitors' Center. The Reserve has the volunteer program infrastructure in place and there appears to be interest within the community for volunteer opportunities.

## **D. RESOURCE MANAGEMENT AND STEWARDSHIP**

### **1. Coordination with Landholding Agencies --**

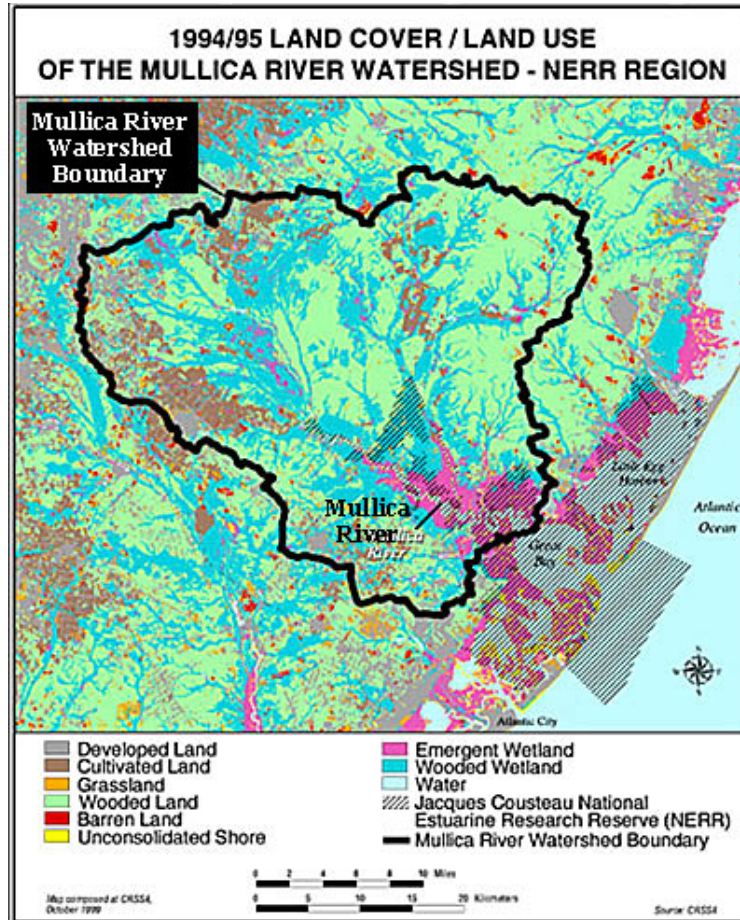
The Jacques Cousteau National Estuarine Research Reserve encompasses more than 110,000 acres of land and water, primarily consisting of land owned and managed by various Federal and state resource management agencies. The New Jersey DEP, the Pinelands Commission and the U.S. Fish and Wildlife Service are the principal land managers in the Reserve.

The review team finds that the lands within the Reserve boundary are effectively protected through the ongoing oversight and enforcement of regulations governing each of the management units. No concerns were raised during the site visit about the management and stewardship of lands within the Reserve boundary or of activities that were inconsistent with the Reserve's goals, objectives or management plan. During the review period, some of the Federal or state management units that comprise the Reserve's core area experienced turnover among managers or other key staff. The review team finds that ongoing coordination with landholding agencies is important for ensuring effective stewardship of the Reserve, and views the Advisory Committee as an important forum to foster this coordination.

**10. ACCOMPLISHMENT:** The landholding agencies that manage the Reserve’s core area are providing effective stewardship to ensure the Reserve’s integrity as a platform for long-term research and education.

## 2. Watershed Planning / Development Pressures –

A number of people interviewed during the site visit expressed a general concern about the need to ensure the integrity of the Reserve’s resources over the long-term in light of increasing development pressures around the Reserve in southern New Jersey. In particular, concern was expressed about growth along Barnegat Bay and the periphery of the Pinelands management area within the Great Bay watershed. A specific concern was also raised about the potential for cumulative impact of new developments with 25 units or less in areas surrounding the Reserve, as are currently allowed under New Jersey’s Coastal Area Facilities Review Act (CAFRA).



The Mullica River/Great Bay watershed remains relatively pristine. Much of the watershed is well-protected through the Pinelands Commission, including the aquifer that supplies much of the water to the Mullica River. However, like most coastal areas, it is

beginning to experience increased development. The Barnegat Bay is more highly developed, particularly at its northern end, with pressures moving gradually south toward the Reserve.

To address these concerns, the Reserve is encouraged to coordinate closely with the NJ DEP's Land Use Regulation division and with local jurisdictions regarding proposed zoning and development actions that may affect the Reserve. Currently, the Reserve is not formally notified of permit applications, for review and comment, for activities in the Mullica River/Great Bay or Barnegat Bay watersheds that may affect the JCNERR. The Reserve is also encouraged to continue its valuable outreach to coastal decision-makers to predict the long-term implications of various build-out scenarios and aid in planning for future growth of coastal communities.

### **3. Acquisition Planning –**

The JCNERR management plan identified a few important areas for conservation as buffers for the Reserve. The plan identified the pocket marsh adjacent to the JCNERR Coastal Education Center as a priority for acquisition due to its significant natural value. The Reserve has met with the willing seller, but to date, has not acquired the parcel due to the high price sought by the owner.

Although the Reserve is relatively pristine, Reserve staff have worked with the Trust for Public Land (TPL), Ocean County, Little Egg Harbor and the New Jersey DEP to discuss the potential for acquisitions that would protect the Reserve from development pressure along its boundaries. For example, the Reserve worked with the Trust for Public Land in the development of TPL's "century plan" to prioritize areas for conservation. The Reserve relies on and shares habitat data as a way of informing decisions on open space acquisition.

In 2002, the Reserve participated in the NERRS land acquisition inventory and developed a list of potential sites for acquisition and/or restoration. Currently, the Reserve manager is also participating in development of System-wide guidelines for reserves to use in updating acquisition strategies in the 5-year management plans.

**7. PROGRAM SUGGESTION:** NOAA encourages the Reserve to work with the NJ coastal program and local governments to evaluate the effects of proposed developments in the Great Bay/Mullica River and Barnegat Bay watersheds on the JCNERR. The Reserve is encouraged to work with DEP to develop a formal mechanism by which the Reserve is notified of, and has an opportunity to comment on, permit applications for activities in the Great Bay/Mullica River watershed that may affect the Reserve.

## V. CONCLUSION

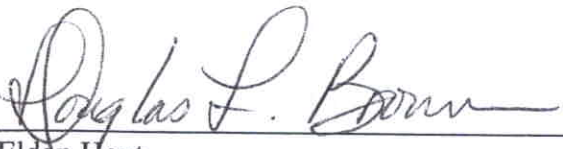
For the reasons stated herein, I find that the State of New Jersey is adhering to the programmatic requirements of the National Estuarine Research Reserve System in its operation of the Jacques Cousteau National Estuarine Research Reserve at Great Bay-Mullica River.

NOAA commends JCNERR for its progress in staffing key positions; drawing on resources within the lead agency, Rutgers IMCS, to support development and implementation of the reserve's management plan, research, education, and coastal training programs; the success of the Reserve's efforts to introduce marine education into New Jersey schools and school districts; and the extensive research program and efforts of reserve staff to integrate research findings into education and training programs. The Reserve has also established a successful interpretive exhibit that helps raise awareness of coastal issues and the Reserve's visibility in the community.

The review team noted several areas for improvement. These include: the timeliness and quality of performance reports; the need to have a senior management presence at the Reserve visitor/education center in Tuckerton; the need to set realistic milestones and deadlines when updating the Reserve management plan, which is due for update this year; and helping to facilitate improved coordination among the New Jersey coastal management program, Reserve and others involved in providing information to coastal decision-makers.

This review contains seven (7) recommendations, all in the form of Program Suggestions. These recommendations should be considered by the State of New Jersey, through Rutgers University prior to the next Section 312 evaluation of the Jacques Cousteau National Estuarine Research Reserve. Appendix C presents a summary of the recommendations.

This is a programmatic evaluation of the Jacques Cousteau National Estuarine Research Reserve that may have implications regarding the state's financial assistance awards. However, it does not make any judgments on, or replace any financial audits related to, the allowability or allocability of any costs incurred.

  
for Eldon Hout,  
Director

8/26/04  
Date

## VI. APPENDICES

### APPENDIX A. PERSONS AND INSTITUTIONS INTERVIEWED

#### Jacques Cousteau National Estuarine Research Reserve Staff

Name	Title	Affiliation
Michael P. DeLuca	Manager, Jacques Cousteau NERR, and Senior Associate Director, Rutgers IMCS	Jacques Cousteau NERR
Janice McDonnell	Assistant Manager	Jacques Cousteau NERR
Eric Simms	Education Coordinator	Jacques Cousteau NERR
Lisa Weiss	Watershed & CTP Coordinator	Jacques Cousteau NERR
Scott Haag	GIS Coordinator	Jacques Cousteau NERR
Josephine Kosc	Volunteer Coordinator	Jacques Cousteau NERR
Michael Kennish	Research Coordinator	Jacques Cousteau NERR
Sharon McKenna	Program Specialist	Jacques Cousteau NERR
Ida Louise Scott	Interpretive Docent	Jacques Cousteau NERR
Jeff Pace	Watershed Coordinator, Sandy Hook	Jacques Cousteau NERR
Greg Sakowicz	SWMP Technician	Jacques Cousteau NERR
Mandy McGuirk-Flynn	Graduate Research Fellow	Jacques Cousteau NERR
Corinne DeLalio	Program Coordinator	Jacques Cousteau NERR

#### State of New Jersey Representatives

Name	Title	Affiliation
J. Frederick Grassle	Director, IMCS	Rutgers, The State University of New Jersey
Ken Able	Director, Rutgers University Marine Field Station; Former Research Coordinator	Rutgers University, IMCS
Rick Lathrop	Director, Rutgers Center Remote Sensing and Spatial Analysis; Former JCNERR GIS Coordinator	Rutgers University, IMCS
Rose Petrecca	Director of Marine Operations	Rutgers University, IMCS
Megan Lipman	Senior Program Coordinator	Rutgers University, Office of Continuing Education
Ruth Ehinger	Manager, New Jersey Coastal Management Program, Office of Policy, Planning and Science	New Jersey Department of Environmental Protection (NJ DEP)
Mark Mauriello	Director, Land Use Management Division	NJ DEP
Cynthia Koritz	Superintendent, Bass River State Forest	NJ DEP, Division of Parks and Forestry
Bob Scro	Director	Barneget Bay National Estuary Program



### **Federal Agency Representatives**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Debbie Long	Manager, Forsythe National Wildlife Refuge	U.S. Fish and Wildlife Service
Sandy Perchetti	Volunteer Coordinator, Forsythe National Wildlife Refuge	U.S. Fish and Wildlife Service

### **Local Government Representatives**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Dave McKeon	Assistant Planning Director	Ocean County Planning
Gene Kobryn	Chair	Little Egg Harbor Township Planning Board
Walter Dougherty	Chair	Little Egg Harbor Township Environmental Commission
Mike Mangum	Director	Ocean County Parks
Lorraine Gowan	Curriculum supervisor	Lacey Township Schools
Jessica Cellini	Teacher	Lacey Township Schools
Rob Causton	Teacher	Oxford Township School District – via remote connection
Jeanne Kimball	Teacher	Oxford Township School District – via remote connection

### **Non-Governmental Representatives**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Steve Evert	Professor of Marine Science	Richard Stockton College
Gretchen Coyle	Board of Directors	Baymen's Museum/Tuckerton Seaport
Carlton Montgomery	Director	Pinelands Preservation Alliance

## **APPENDIX B. RESPONSE TO WRITTEN COMMENTS**

Members of the public and persons contacted during the site visit were offered an opportunity to submit written comments until October 8, 2003. The review team did not receive any written comments.

## APPENDIX C. SUMMARY OF ACCOMPLISHMENTS AND RECOMMENDATIONS

### SUMMARY OF ACCOMPLISHMENTS:

Accomp. #	Accomplishment
1	The Reserve manager, with support from Rutgers IMCS, has built a highly skilled, professional and effective team to operate the Reserve's programs. The Reserve staff is also commended for their teamwork and interdisciplinary approach to carrying out the Reserve's programs.
2	Rutgers IMCS is to be commended for its continued support of the JCNERR, particularly in providing staff and resources within the University to support the development and implementation of the Reserve's management plan, research, education and training programs.
3	The Reserve has achieved a great deal of progress in implementing the Reserve's facilities plan since the Reserve's designation, including the design and construction of education, research and office facilities at the Coastal Education Center, a joint Visitors Center, and interpretive exhibits.
4	The Reserve has made significant progress toward implementing the Reserve's 5-year management plan, particularly: the administrative plan; facilities development plan; education, interpretation and outreach plan; and the research and monitoring plan.
5	The Reserve is commended for its mutually-beneficial work with the Barnegat Bay NEP, which reflects effective coordination and efficiency between programs in carrying out responsibilities in a shared management area. This work is important for increasing scientific and public understanding of the relationship between development patterns and the condition of the bay.
6	The Reserve is commended for its continuing support for system-wide planning for the NERRS, while carrying out a full load of core program activities at the Reserve. NOAA recognizes the initiative and dedication of the JCNERR staff in performing both functions.
7	The Reserve has made substantial progress implementing its Research Plan, particularly in its implementation of the System-wide Monitoring Program, completion of the Reserve's site characterization, progress on the site profile, support for the Barnegat Bay monitoring and science effort, and its effective integration of GIS capabilities in its research and training programs.
8	The Reserve has made significant progress implementing its Education Plan, particularly in formal education, by successfully implementing MARE in 50 schools, training more than 3,500 New Jersey educators in a comprehensive professional teacher development and marine science education program; and establishing the <i>Life on the Edge</i> Interpretive Exhibit. The JCNERR has established itself as a leader in the Reserve system in using real-time data and technology in the classroom and in highlighting current research findings in education programs.
9	Reserve staff has been effective in integrating the use of research, GIS tools, and training capabilities to support local governments in planning for compatible growth. The Reserve has also been very effective in increasing program efficiencies by partnering with the Rutgers Office of Continuing Education for management and logistical support for coastal decision-maker workshops.
10	The landholding agencies that manage the Reserve's core area are providing effective stewardship to ensure the Reserve's integrity as a platform for long-term research and education.



## SUMMARY OF RECOMMENDATIONS:

**PS = Program Suggestion**

**NA = Necessary Action**

Rec. #	PS/NA	Recommendation
1	PS	The Reserve is encouraged to have a senior management presence in Tuckerton at the Coastal Education Center on a full-time or rotational basis to oversee day-to-day operations at the field location.
2	PS	The program should improve the timeliness of its performance reports and work with NOAA to clarify expectations regarding the level of detail to be provided within the reports.
3	PS	NOAA encourages the JCNERR to 1) engage the Reserve Advisory Committee in planning, particularly in the review and update of the 5-year management plan and to provide an ongoing forum for coordination among Reserve partners, and 2) to explore the need for changes to the structure (to formalize operational changes that have taken place) and schedule of the advisory committees as part of the 5-year management plan update.
4	PS	In updating its management plan, which is due this year, the Reserve is encouraged to engage the Reserve Advisory Committee in long-term planning for Reserve's program priorities, facilities needs, and watershed protection efforts, to clarify the structure of advisory committees, and to set realistic milestones for progress in these areas over the next 5 years.
5	PS	The Reserve is encouraged to help facilitate improved communication and collaboration among the New Jersey coastal program, Sea Grant program, and the Reserve on issues of mutual concern, particularly regarding delivery of training and technical assistance for county and municipal officials on coastal issues, such as stormwater runoff and other land-based sources of pollution.
6	PS	In light of growing demand for education, interpretive and training programs and limited staff resources, NOAA encourages the Reserve to remain focused and strategic in expanding these programs. It will be critical to ensure the level of capacity and infrastructure needed to support expansion of the geographic scope and the range of target audiences for education, training, interpretation and outreach.
7	PS	NOAA encourages the Reserve to work with the NJ coastal program and local governments to evaluate the effects of proposed developments in the Great Bay/Mullica River and Barnegat Bay watersheds on the JCNERR. The Reserve is encouraged to work with DEP to develop a formal mechanism by which the Reserve is notified of, and has an opportunity to comment on, permit applications for activities in the Great Bay/Mullica River watershed.

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<sup>i</sup> All photos and graphics courtesy of Rutgers IMCS, JCNERR website.